

**BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF CALIFORNIA**



**FILED**  
6-15-16  
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Application of Pacific Gas and Electric  
Company Proposing Cost of Service and  
Rates for Gas Transmission and Storage  
Services for the Period 2015 - 2017  
(U39G).

And Related Matter

Application 13-12-012  
(Filed December 19, 2013)

Investigation 14-06-016  
(Filed June 26, 2014)

**NOTICE OF EX PARTE COMMUNICATIONS**



Thomas J. Long, Legal Director  
Marcel Hawiger, Staff Attorney

THE UTILITY REFORM NETWORK  
785 Market Street, Suite 1400  
San Francisco, CA 94103  
(415) 929-8876 (office)  
(415) 929-1132 (fax)  
[TLong@turn.org](mailto:TLong@turn.org)

June 15, 2016

Pursuant to Rule 8.4 of the Commission's Rules of Practice and Procedure, The Utility Reform Network (TURN) gives notice of the following ex parte communications.

On June 10, 2016, Thomas Long, TURN's Legal Director, and Marcel Hawiger, TURN Staff Attorney, had two separate meetings with: (1) John Reynolds, advisor to Commissioner Peterman and Adam Orford, intern for Commissioner Peterman's office; and (2) Rachel Peterson, Chief of Staff to Commissioner Randolph. The duration of each meeting was approximately 40 minutes. The two meetings took place at the Commission's office in San Francisco from approximately 10:30 a.m. to noon. The communications consisted of oral presentations accompanied by written handouts (same handouts for both meetings), a copy of which are attached.

In the meetings, Mr. Long discussed the following points, most of which are addressed in TURN's handouts: (1) With respect to the PD's rate impact on residential customers, the Commission should focus on the Transport Only rate increases (79.9% without amortization and 97.0% with amortization) because that rate best reflects the costs covered by the GRC and GT&S cases and excludes commodity costs over which the Commission has little control; (2) natural gas commodity costs are now at historic lows and EIA is forecasting increasing prices for 2017 – increases in gas commodity costs would only exacerbate the harsh bill impacts of the PD's rate increases; (3) PG&E's own analysis (Ex. TURN-75, attached) showed that rates even lower than what the PD would approve would make PG&E's bundled residential gas rates higher than average rates in all other regions of the country; (4) the PD's resolution for ECA Phases 1 and 2, Hydrostatic Station Testing, Critical Documents, and post-1961 pipeline hydrotesting would erroneously allow PG&E up front recovery for acknowledged unreasonable costs and should be modified as explained in the attached handout; (5) the pipeline hydrotesting unit cost should be

reduced to \$0.84 million per mile, for the reasons explained in the attached handout; (6) the PD's minimal disallowances for corrosion control fail to hold shareholders appropriately responsible for the consequences for PG&E's violation of regulatory requirements, as detailed in the attached handout, even though ratepayers fully funded PG&E to conduct a compliant and prudent corrosion control program; (7) the allocation of the \$850 million penalty offset and the amortization period should be addressed in a separate decision after all the other issues are addressed in a first decision – new rates, not including the \$850 million offset and amortization of the undercollection could go into effect upon issuance of that first decision; (8) TURN believes the five-month disallowance for the delay caused by PG&E's egregious ex parte violations is fully within the Commission's discretion and supported by sound legal analysis; and (9) applying the five-month disallowance after applying the \$850 million penalty offset effectively dilutes and reduces the \$850 million penalty, contrary to the intent of the San Bruno Penalties decision.

Mr. Hawiger addressed unit costs for vintage pipe replacement (ViPER). He distributed a handout containing three pages from PG&E's workpapers for that program, attached to this notice. Mr. Hawiger explained that the 60 miles of ViPER projects planned for the rate case cycle are contained on one page. There are nine more work paper pages listing future projects, as the ViPER represents only the beginning of a large replacement program. Mr. Hawiger noted that, notwithstanding the size of the program, PG&E's entire justification for its unit cost estimate is contained on the single page WP 4A-722, and that ORA had to conduct extensive discovery to obtain the bases for the unit costs. Mr. Hawiger stated that the Commission should have admonished PG&E for failing to provide necessary data to support its proposed unit cost.

Mr. Hawiger recommended that the PD be modified to adopt ORA's unit costs, as more properly based on the record evidence. However, Mr. Hawiger explained that, if the Commission is concerned about providing sufficient funding for the ViPER, it should calculate total project costs for 2015-2017 and then normalize (divide by three) to obtain test year costs. The PD artificially inflates test year costs because PG&E forecasts replacing more 24-inch pipe during the test year, and the PD increases the unit cost of 24-inch pipe. The PD's methodology would provide PG&E substantially more money over 2015-2017 than required for the program.

Dated: June 15, 2016

Respectfully submitted,

By: \_\_\_\_\_/s/\_\_\_\_\_  
Thomas J. Long

Thomas J. Long, Legal Director  
**THE UTILITY REFORM NETWORK**

**ATTACHMENTS**  
**TURN HANDOUTS DISTRIBUTED AT EX PARTE MEETINGS**

Handout concerning customer impacts (1 page)

Handout concerning up front funding for unreasonable costs and hydrotesting unit costs (2 pages)

Handout concerning PG&E mismanagement of corrosion control (1 page)

Chart showing PG&E's comparison of proposed GT&S rates to residential rates in other regions of the United States (1 page)

Excerpt from PG&E's workpapers for the ViPER program (4 pages)

**While Disconnections from PG&E Service Continue to Increase at an Alarming Pace,  
The PD Would Add Unaffordable Gas Rate Increases  
On Top of the Large 2014 GRC Gas Rate Hikes**

The PD would impose an unprecedented 83% GT&S revenue requirement increase on top of the 35% 2014 GRC increase for Gas Distribution:

**GRC/GT&S PD RR Increases (\$, 000's omitted)**

	<b>2014 Pre-GRC</b>	<b>2014 Post-GRC</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>Total % Increase</b>
Gas Distribution	1,295	1,559	1,631	1,742	1,742	34.5%
GT&S	715	715	995	1,183	1,309	83.1%
<b>Total</b>	<b>2,010</b>	<b>2,274</b>	<b>2,626</b>	<b>2,925</b>	<b>3,051</b>	<b>51.8%</b>

Note: Table excludes amortization impacts

These revenue requirement increases translate into the following rate increases (that will be unaffordable for many households:

**% Increase in Residential Rates from 2014 to 2017 Under PD<sup>1</sup>**

	<b>Transport Only</b>		<b>Bundled</b>	
	<b>No Amortization</b>	<b>Amortization</b>	<b>No Amortization</b>	<b>Amortization</b>
Without \$850M offset (App. J)	79.9%	97.0%	35.9%	45.6%
With \$850M offset (App. G)	77.1%	92.0%	33.9%	42.3%

- In terms of average bill impacts, the bundled rate increase (w/amortization and \$850M offset) translates to a \$17.42 increase per month, \$209 per year, for non-CARE customers, and \$13.94 per month, \$167 per year, for CARE customers.
- In heavy usage winter months, the bill increase for a non-CARE customer could be as high as \$40 per month.

These steep rate and bill increases would be imposed against the backdrop of a serious problem of steadily mounting disconnections for PG&E's customers:

**PG&E Disconnections for Non-Payment**

	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Annual disconnects</b>	179,071	188,756	235,138	251,881	280,354	309,600
<b>% Annual Increase</b>	-	4.7%	24.6%	7.1%	11.3%	10.4%
<b>Cumulative % Increase</b>	-	4.7%	31.3%	40.7%	56.6%	72.9%

<sup>1</sup> Amortization increases in the table are based on the "end-use rate" method for recovering undercollection amounts (PG&E scenarios A and C), using an 18-month amortization period. PG&E's 2017 figures do not include projected increases in gas commodity costs or any increase to gas distribution rates in 2017, both unrealistic assumptions. In its 2017 GRC (A.15-09-001), PG&E has requested a 4.9% increase to gas distribution rates in 2017.

## **The PD Should Be Corrected to Not Allow Up Front Funding for Unreasonable Costs**

Summary of Problem: For several programs, PD finds much of PG&E's forecast unreasonable based on past imprudence, but gives PG&E full up-front funding anyway, with the idea that eventually ratepayers will get refunds of unreasonable costs through a balancing account, or other means.

Affects: PD Section 8.2 (ECA Phases 1 and 2, Hydrostatic Station Testing); PD Section 8.3 (Critical Documents); PD Section 6.2.3 (Hydrotesting)

Why This is a Problem: (1) Legal error to allow recovery of acknowledged unreasonable costs; (2) Gives PG&E ability and incentive to avoid any refunds to customers by maximizing spending on recoverable costs – "use it or lose it"

### ECA Phases 1 and 2:

- Purpose is to correct recordkeeping deficiencies for station components so that PG&E can support MAOP with traceable, verifiable and complete records.
  - Station component equivalent of pipeline MAOP validation program, which was fully disallowed from recovery in PSEP, D.12-12-030.
- PD would erroneously allow PG&E to recover costs for pre-1956 components even though the recordkeeping obligations pre-dated 1956:
  - PD (p. 125) itself finds this recordkeeping is required by PU §451;
  - D.12-12-030 (p. 87) said PG&E was responsible for "maintaining records of the location and engineering details of system components" from the "day it installed facilities and equipment for the system."
- None of ECA Phase 1 and 2 costs are appropriate for recovery. Full \$24.3 million should be disallowed.

### Hydrostatic Station Testing (HST)

- This work is contingent on results of ECA Phase 1 and 2 work, neither or which had begun in early 2015. In light of the delay in this decision, it is extremely likely that little, if any, HST work will begin in this rate case period.
- Solution: rather than allowing up-front recovery (\$5.9M expense) for work that most likely will not be done, allow PG&E to track any costs it incurs in a memorandum account for potential future recovery, subject to reasonableness review.

### Critical Documents

- As with ECA Phase 1 and 2 and HST, PD (p. 130) finds that work related to post-1956 facilities is to remedy past recordkeeping deficiencies and should not be recovered.
- Again, pre/post 1956 is the wrong line to draw as recordkeeping obligations pre-dated 1956. So, full \$11.6M expenses should be disallowed.
  - Alternatively, if the Commission still wants to use 1956 as a dividing line, then adopt Indicated Shippers recommendation to disallow 85% of PG&E's forecast based on record evidence that 85% of facilities were installed post-1955.

### Pipeline Hydrotesting

- Here's the breakdown of hydrotesting miles in PG&E's forecast that the PD (p. 59) endorses:

Untested Pipe By Installation Period		
	Miles	Percentage
Pre-1956 or IM tests	315	61.8%
Jan 1, 1956 – June 30, 1961	98	19.2%
July 1, 1961 - Present	97	19.0%
Totals	510	100%

- Even though there is no dispute that PG&E should not be allowed to recover costs of the 97 post-7/1/61 miles, the PD does not disallow these costs -- it only disallows 19.2% of the forecast, not 38.2%. Instead, the PD expects PG&E to test "up to 50" additional post-1961 miles at shareholder cost.
  - In other words, PG&E is expected to test up to 560 miles.
- This is error:
  - (1) PG&E always said 510 miles was near its limit and now says it is unlikely to test even 510 miles. This means that effectively there will be no disallowance for the post-1961 miles.
  - (2) PD doesn't explain "up to 50 miles" when PG&E's own forecast showed 97 miles.
- The PD should be corrected to disallow 38.2% of forecast costs, which reduces expenses by about \$33M.

### The PD's Hydrotesting Unit Cost Figure Should Be Corrected

- Here is the trend of unit costs shown in the record:

Hydrotesting Unit Costs (\$M/mile)			
2011 Recorded	2012 Recorded	2013 Recorded	2014 Forecast
1.42	1.03	0.84	1.21

- Even though the PD (p. 58) finds that unit costs should decrease over time, the PD approves PG&E's forecast of \$0.97M/mile, which is a significant increase over 2013 recorded costs.
- PG&E admitted that 2013 costs were representative of expected unit costs for the 2015-2017 period, based on expected test length.
- PG&E conceded that 2014 forecast costs were based on tests of shorter length than expected in 2015-2017 period and thus unrepresentative.
- Correcting the unit cost to \$0.84M reduces hydrotesting expenses by about \$24M.



## **Corrosion Control at PG&E – A Legacy of Violations and Poor Management**

Despite corrosion being one of the most significant safety risks for transmission pipe, the record contains abundant evidence that PG&E's corrosion control program was riddled with violations and poor practices, much of it from PG&E's own internal auditors and paid consultants (who generally don't like to criticize the party that's paying them)

### Audit Findings and PG&E Self-Reported Violations

- 49 separate CPUC adverse audit findings from 2008 through 2013
- 11 self-reported violations by PG&E

### 2010 Internal Audit Reports

- Finds violations concerning, e.g., (1) identification of corrosion leaks; (2) corrosion leak repairs; (3) low levels of cathodic protection; (4) operator qualifications; (5) remediation of contacted casings
- Contacted casings: despite federal guidelines requiring corrective action within 6 months of finding a contacted casing, PG&E failed to initiate corrective action for 35 of 39 known contacted casings.

### 2011 Atmospheric Corrosion Internal Audit Report

- Finds many violations, including: (1) no or late follow-up on reported issues; (2) missing inspection records; (3) operator qualifications; (4) requiring 20% wall loss before taking action, instead of taking action if any deterioration is occurring; (5) failure to inspect exposed piping with limited access.

### 2014 Exponent (PG&E's paid outside consultants) Report

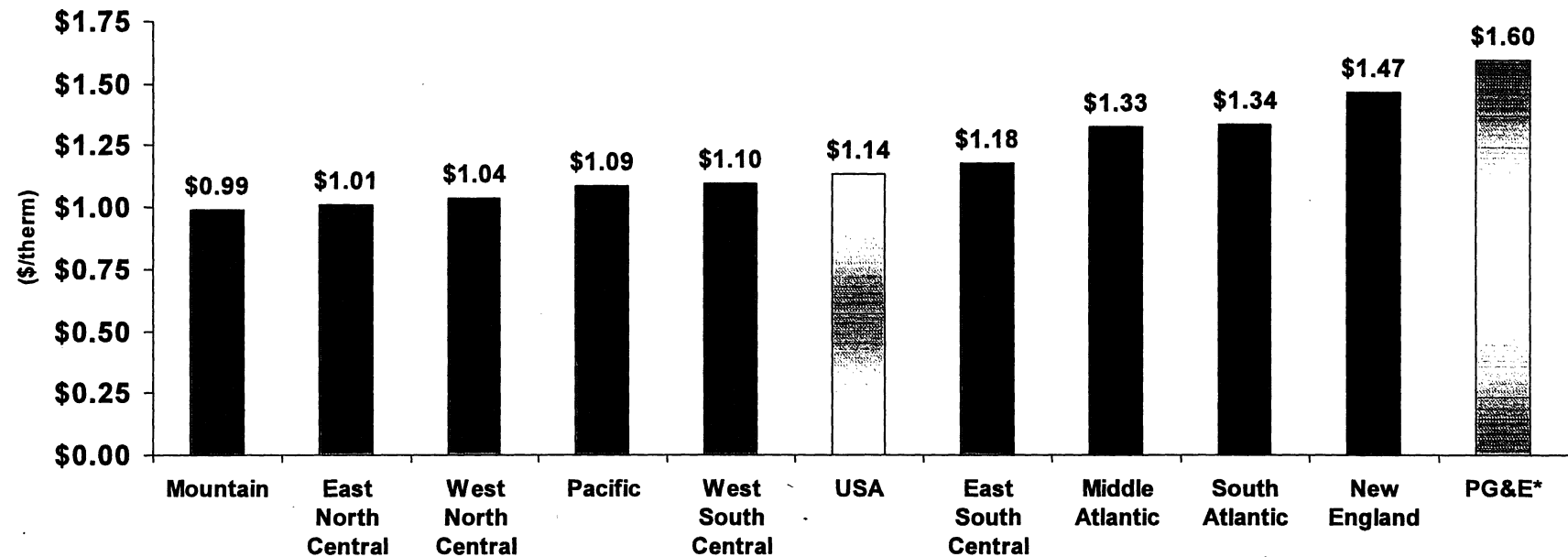
- 33 pages of specific problems called out, including: (1) casings: lack of procedures for monitoring certain casings; (2) atmospheric corrosion: several identified violations, e.g., failure to properly inspect air-to-soil transitions and exposed piping.
- Causes of identified problems include: (1) corrosion viewed as low priority; (2) inconsistent interpretation of requirements; (3) lack of accountability; (4) lack of asset information; (5) lack of centralized, complete, and accurate data; (6) lack of knowledge/training; (7) lack of program oversight.

### Other evidence of Casings violations

Despite 49 CFR § 192.491(c), which requires adequate records to show that corrosive conditions do not exist or that corrosion control is adequate, PG&E did not have basic information to show that it was properly managing contacted casings. PG&E did not have:

- Any information showing when it initiated action to mitigate contacted casings;
- Available information showing when it completed remediation of contacted casings;
- A standard for maximum amount of time for mitigating contacted casings.

## **2015 Residential Average Gas Rate By Region**



Source: American Gas Association, *2011 Gas Facts* (2012, 2013, 2014 and 2015 reflect 2% CPI adjustment over 2011)

\*PG&E source: GRC Application and Management Review Draft of 2015 GT&S Rate Case Application

TURN  
PGE - 05

Application: 13-12-012  
(U 39 G)  
Exhibit No.: \_\_\_\_\_  
Date: January 23, 2015  
Witness: Bennie Barnes

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**PACIFIC GAS AND ELECTRIC COMPANY**  
**2015 GAS TRANSMISSION AND STORAGE RATE CASE**  
**DECEMBER 19, 2013 WORKPAPERS WITH ERRATA**  
**WORKPAPERS SUPPORTING**  
**CHAPTER 4A**  
**TRANSMISSION PIPE INTEGRITY AND EMERGENCY RESPONSE**  
**PROGRAMS**  
**VOLUME 2 OF 2**

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Pacific Gas and Electric Company  
2015 Gas Transmission and Storage Rate Case  
Workpapers Supporting Chapter 4A, Transmission Pipe Integrity and Emergency Response Programs  
Vintage Pipe Replacement

Cost Calculated with Escalation (thousands of dollars)

Year	PG&E	StanPac <sup>1</sup>	Unescalated Total	Escalation Factor	Escalated Total
2015	\$ 178,342	\$ 2,802	\$ 181,144	1.070	\$193,824
2016	\$ 178,342	\$ 2,802	\$ 181,144	1.097	\$198,715
2017	\$ 178,342	\$ 2,802	\$ 181,144	1.126	\$203,969

Note: 1. Costs are 6/7 of the total and reflect PG&E costs

PG&E and StanPac Volumes and Unescalated Costs

Route	Construction Feature	MP Begin	MP End	OUTSIDE DIAMETER (Inches)	Cumulative Total Mileage	Approx. Year Planned	Cumulative TOC (%)	Dia Group	Approx. Length (miles)	Unit Cost (\$/mi)	PG&E or StanPac	StanPac Factor (6/7 of Total)	Total Cost
300A	Wrinkle	490.7	491.8	34	1.2	2015	12.1%	>24	1.20	13.2	PG&E	1	\$ 15,840
300A	Wrinkle	493.9	494.9	34	2.2	2015	22.5%	>24	1.00	13.2	PG&E	1	\$ 13,200
105C	Field Miter	0.3	1.8	24	3.7	2015	30.0%	12-24	1.50	5.8	PG&E	1	\$ 8,700
153	Mfg Miter<20	10.4	13.0	30	6.4	2015	36.1%	>24	2.70	13.2	PG&E	1	\$ 35,640
300A	Wrinkle	492.9	493.4	34	7.0	2015	41.6%	>24	0.60	13.2	PG&E	1	\$ 7,920
132	BBCR	27.2	28.4	24	8.3	2015	46.3%	12-24	1.30	5.8	PG&E	1	\$ 7,540
300A	Wrinkle	155.7	156.4	34	9.0	2015	49.2%	>24	0.70	13.2	PG&E	1	\$ 9,240
191	Field Miter	8.2	9.3	24	10.2	2015	51.5%	12-24	1.20	5.8	PG&E	1	\$ 6,960
220	BBCR	15.0	18.1	10.75	12.5	2015	53.5%	<12	2.30	5.28	PG&E	1	\$ 12,144
132	BBCR	24.5	25.0	24	13.1	2015	55.4%	12-24	0.60	5.8	PG&E	1	\$ 3,480
109	Field Miter	48.2	48.8	26	13.8	2015	57.3%	>24	0.70	13.2	PG&E	1	\$ 9,240
132	Mfg Miter>=20	31.2	31.7	30	14.3	2015	59.2%	>24	0.50	13.2	PG&E	1	\$ 6,573
0401-01	Field Miter	1.5	2.4	12.75	15.2	2015	61.0%	12-24	0.90	5.8	PG&E	1	\$ 5,220
1813-02	Field Miter	13.3	14.1	10.75	16.0	2015	62.7%	<12	0.80	5.28	PG&E	1	\$ 4,224
132	BBCR	50.2	50.8	24	16.6	2015	64.3%	12-24	0.60	5.8	PG&E	1	\$ 3,480
132	BBCR	51.0	51.4	24	17.0	2015	65.5%	12-24	0.40	5.8	PG&E	1	\$ 2,320
153	Mfg Miter<20	2.1	2.2	34	17.1	2015	66.5%	>24	0.10	13.2	PG&E	1	\$ 1,320
0401-01	Field Miter	1.0	1.5	12.75	17.7	2015	67.5%	12-24	0.60	5.8	PG&E	1	\$ 3,480
132	BBCR	26.4	26.6	24	18.0	2015	68.5%	12-24	0.30	5.8	PG&E	1	\$ 1,740
0401-01	Field Miter	0.0	0.5	12.75	18.5	2015	69.5%	12-24	0.50	5.8	PG&E	1	\$ 2,924
132	BBCR	26.1	26.4	24	18.8	2015	70.5%	12-24	0.30	5.8	PG&E	1	\$ 1,740
153	Mfg Miter>=20	3.5	3.5	30	18.9	2015	71.3%	>24	0.10	13.2	PG&E	1	\$ 1,320
132	Mfg Miter>=20	30.4	30.7	30	19.2	2015	72.2%	>24	0.30	13.2	PG&E	1	\$ 3,960
147	BBCR	0.5	0.5	24	19.5	2015	73.0%	12-24	0.30	5.8	PG&E	1	\$ 1,740
191	Field Miter	7.7	8.1	24	19.9	2015	73.7%	12-24	0.40	5.8	PG&E	1	\$ 2,291
StanPac5	Field Miter	0.9	1.4	24	20.5	2015	74.4%	12-24	0.56	5.8	StanPac	0.857143	\$ 2,802
105C	Field Miter	0.0	0.1	24	20.6	2015	75.1%	12-24	0.14	5.8	PG&E	1	\$ 808
220	BBCR	12.2	13.2	10.75	21.6	2015	75.8%	<12	1.00	5.28	PG&E	1	\$ 5,298
126A	Field Miter	0.8	3.1	6.625	23.9	2016	76.4%	<12	2.25	5.28	PG&E	1	\$ 11,877
105N	Field Miter	28.6	29.3	26	24.5	2016	76.9%	>24	0.62	13.2	PG&E	1	\$ 8,215
147	BBCR	0.5	0.6	24	24.7	2016	77.5%	12-24	0.21	5.8	PG&E	1	\$ 1,241
132	BBCR	25.9	26.0	24	24.8	2016	78.1%	12-24	0.15	5.8	PG&E	1	\$ 870
132	BBCR	26.0	26.1	24	25.0	2016	78.6%	12-24	0.15	5.8	PG&E	1	\$ 857
StanPac5	Field Miter	1.7	2.1	24	25.6	2016	79.2%	12-24	0.56	5.8	StanPac	0.857143	\$ 2,802
132	BBCR	50.0	50.2	24	25.7	2016	79.7%	12-24	0.18	5.8	PG&E	1	\$ 1,038
021C	Mfg Miter<20	39.6	40.2	12.75	26.3	2016	80.3%	12-24	0.62	5.8	PG&E	1	\$ 3,581
1813-02	Field Miter	16.2	16.4	10.75	26.6	2016	80.8%	<12	0.24	5.28	PG&E	1	\$ 1,278
210B	Field Miter	21.0	21.8	16	27.4	2016	81.3%	12-24	0.78	5.8	PG&E	1	\$ 4,536
105N	Field Miter	28.1	28.6	34	27.9	2016	81.7%	>24	0.51	13.2	PG&E	1	\$ 6,730
210B	Field Miter	13.0	13.7	16	28.6	2016	82.2%	12-24	0.69	5.8	PG&E	1	\$ 4,009
153	Mfg Miter<20	3.5	3.6	30	28.6	2016	82.6%	>24	0.03	13.2	PG&E	1	\$ 388
300A	Wrinkle	468.2	470.0	34	30.3	2016	83.0%	>24	1.74	13.2	PG&E	1	\$ 22,955
220	BBCR	13.5	14.0	10.75	30.9	2016	83.4%	<12	0.54	5.28	PG&E	1	\$ 2,836
220	BBCR	14.5	15.0	10.75	31.4	2016	83.7%	<12	0.52	5.28	PG&E	1	\$ 2,748
132	BBCR	27.1	27.2	24	31.5	2016	84.1%	12-24	0.09	5.8	PG&E	1	\$ 545
021C	Mfg Miter<20	40.2	40.6	12.75	31.9	2016	84.4%	12-24	0.40	5.8	PG&E	1	\$ 2,329
105N	Field Miter	30.0	30.3	30	32.2	2016	84.7%	>24	0.32	13.2	PG&E	1	\$ 4,223
300A	Wrinkle	464.2	465.4	34	33.4	2016	85.0%	>24	1.19	13.2	PG&E	1	\$ 15,748
021C	Field Miter	37.8	38.1	12.75	33.7	2016	85.3%	12-24	0.32	5.8	PG&E	1	\$ 1,872
132	BBCR	49.6	49.7	24	33.8	2016	85.5%	12-24	0.09	5.8	PG&E	1	\$ 516
186	Mfg Miter>=20	6.7	9.0	4.5	36.2	2016	85.8%	<12	2.35	5.28	PG&E	1	\$ 12,408
105N	Field Miter	29.4	29.7	30	36.4	2016	86.1%	>24	0.25	13.2	PG&E	1	\$ 3,342
210B	Field Miter	24.4	24.8	16	36.8	2016	86.3%	12-24	0.40	5.8	PG&E	1	\$ 2,305
132	BBCR	27.0	27.1	24	36.9	2016	86.5%	12-24	0.06	5.8	PG&E	1	\$ 375
021C	Field Miter	42.7	43.0	12.75	37.2	2016	86.8%	12-24	0.29	5.8	PG&E	1	\$ 1,672
300A	Wrinkle	470.0	471.0	34	38.2	2016	87.0%	>24	1.00	13.2	PG&E	1	\$ 13,200
132A	BBCR	0.0	0.1	16	38.2	2016	87.3%	12-24	0.05	5.8	PG&E	1	\$ 317
132	BBCR	51.4	51.5	24	38.3	2016	87.5%	12-24	0.07	5.8	PG&E	1	\$ 433
105N	Field Miter	29.7	30.0	30	38.5	2016	87.7%	>24	0.20	13.2	PG&E	1	\$ 2,640
132	Mfg Miter>=20	35.1	35.2	30	38.6	2016	87.9%	>24	0.06	13.2	PG&E	1	\$ 755
126A	Field Miter	4.1	4.9	6.625	39.4	2016	88.1%	<12	0.80	5.28	PG&E	1	\$ 4,224
300B	Wrinkle	290.3	293.2	34	42.3	2016	88.3%	>24	2.90	13.2	PG&E	1	\$ 38,280
300A	Wrinkle	160.7	165.4	34	46.9	2017	88.6%	>24	4.60	13.2	PG&E	1	\$ 60,720
300A	Wrinkle	467.3	468.2	34	47.8	2017	88.8%	>24	0.90	13.2	PG&E	1	\$ 11,880
132	BBCR	0.9	1.0	24	47.9	2017	89.0%	12-24	0.10	5.8	PG&E	1	\$ 580
132	BBCR	25.0	25.1	24	48.0	2017	89.2%	12-24	0.10	5.8	PG&E	1	\$ 580
300A	Wrinkle	462.7	463.5	34	48.8	2017	89.4%	>24	0.80	13.2	PG&E	1	\$ 10,560

Pacific Gas and Electric Company  
2015 Gas Transmission and Storage Rate Case  
Workpapers Supporting Chapter 4A, Transmission Pipe Integrity and Emergency Response Programs  
Vintage Pipe Replacement

126A	Field Miter	5.6	6.3	6.625	49.7	2017	89.6%	<12	0.91	5.28	PG&E	1	\$ 4,789
132	BBCR	27.0	27.0	24	49.8	2017	89.7%	12-24	0.10	5.8	PG&E	1	\$ 580
021C	Field Miter	43.4	43.6	12.75	50.0	2017	89.9%	12-24	0.20	5.8	PG&E	1	\$ 1,160
105C	Field Miter	1.8	1.8	22	50.1	2017	90.1%	12-24	0.10	5.8	PG&E	1	\$ 580
300B	Wrinkle	410.9	413.1		52.7	2017	90.2%	>24	2.60	13.2	PG&E	1	\$ 34,320
300B	Wrinkle	397.7	400.2	34	55.2	2017	90.4%	>24	2.50	13.2	PG&E	1	\$ 33,008
114	BBCR	6.8	7.2	16	55.7	2017	90.6%	12-24	0.50	5.8	PG&E	1	\$ 2,900
021C	Field Miter	43.0	43.2	12.75	55.9	2017	90.7%	12-24	0.20	5.8	PG&E	1	\$ 1,160
021B	Field Miter	4.9	7.0	16	58.0	2017	90.9%	12-24	2.10	5.8	PG&E	1	\$ 12,180
220	BBCR	14.3	14.5	10.75	58.3	2017	91.0%	<12	0.30	5.28	PG&E	1	\$ 1,584
191	Field Miter	8.1	8.2	24	58.4	2017	91.2%	12-24	0.10	5.8	PG&E	1	\$ 580
220	BBCR	14.0	14.2	10.75	58.6	2017	91.3%	<12	0.22	5.28	PG&E	1	\$ 1,182
StanPac5	Field Miter	0.0	0.1	24	58.6	2017	91.3%	12-24	0.05	5.8	StanPac	0.857143	\$ 244
StanPac3	Field Miter	175.3	175.5	26	58.9	2017	91.3%	>24	0.23	13.2	StanPac	0.857143	\$ 2,558
300B	Wrinkle	422.9	425.2	34	61.2	Post Rate Case	91.5%	>24	2.32	13.2	PG&E	1	\$ 30,655
147	BBCR	0.6	0.6	24	61.2	Post Rate Case	91.6%	12-24	0.06	5.8	PG&E	1	\$ 326
153	Mfg Miter<20	10.3	10.4	30	61.3	Post Rate Case	91.8%	>24	0.07	13.2	PG&E	1	\$ 863
220	BBCR	13.2	13.5	10.75	61.5	Post Rate Case	91.9%	<12	0.22	5.28	PG&E	1	\$ 1,141
105N	Field Miter	29.3	29.4	30	61.7	Post Rate Case	92.1%	>24	0.15	13.2	PG&E	1	\$ 2,018
300A	Wrinkle	293.5	296.4	34	64.6	Post Rate Case	92.2%	>24	2.91	13.2	PG&E	1	\$ 38,380
300B	Wrinkle	295.7	297.7	34	66.7	Post Rate Case	92.4%	>24	2.07	13.2	PG&E	1	\$ 27,303
114	BBCR	7.3	7.7	12.75	67.0	Post Rate Case	92.5%	12-24	0.37	5.8	PG&E	1	\$ 2,174
153	Mfg Miter<20	13.5	13.6	30	67.1	Post Rate Case	92.6%	>24	0.06	13.2	PG&E	1	\$ 785
300A	Wrinkle	465.5	466.1	34	67.7	Post Rate Case	92.8%	>24	0.58	13.2	PG&E	1	\$ 7,700
300B	Wrinkle	264.6	268.6	34	71.7	Post Rate Case	92.9%	>24	4.01	13.2	PG&E	1	\$ 52,958
300A	Wrinkle	471.5	472.1	34	72.2	Post Rate Case	93.0%	>24	0.55	13.2	PG&E	1	\$ 7,205
300B	Wrinkle	288.4	290.3	34	74.1	Post Rate Case	93.1%	>24	1.85	13.2	PG&E	1	\$ 24,385
1816-15	Field Miter	0.0	0.5	8.625	74.5	Post Rate Case	93.3%	<12	0.47	5.28	PG&E	1	\$ 2,472
300B	Wrinkle	293.2	295.0	34	76.4	Post Rate Case	93.4%	>24	1.81	13.2	PG&E	1	\$ 23,915
300B	Wrinkle	238.8	240.2	34	77.8	Post Rate Case	93.5%	>24	1.43	13.2	PG&E	1	\$ 18,828
300B	Wrinkle	257.5	261.0	34	81.3	Post Rate Case	93.6%	>24	3.53	13.2	PG&E	1	\$ 46,588
1813-02	Wrinkle	7.6	8.4	10.75	82.2	Post Rate Case	93.7%	<12	0.88	5.28	PG&E	1	\$ 4,652
300B	Wrinkle	417.4	419.1	34	83.9	Post Rate Case	93.9%	>24	1.73	13.2	PG&E	1	\$ 22,825
300B	Wrinkle	420.7	422.5	34	85.6	Post Rate Case	94.0%	>24	1.71	13.2	PG&E	1	\$ 22,553
1813-02	Wrinkle	3.1	3.9	10.75	86.5	Post Rate Case	94.1%	<12	0.84	5.28	PG&E	1	\$ 4,455
210B	Field Miter	22.0	22.2	16	86.6	Post Rate Case	94.2%	12-24	0.18	5.8	PG&E	1	\$ 1,015
021B	Field Miter	17.3	18.6	16	88.0	Post Rate Case	94.3%	12-24	1.38	5.8	PG&E	1	\$ 8,021
300B	Wrinkle	419.1	420.7	34	89.6	Post Rate Case	94.4%	>24	1.60	13.2	PG&E	1	\$ 21,125
1813-02	Wrinkle	1.5	2.3	10.75	90.4	Post Rate Case	94.5%	<12	0.79	5.28	PG&E	1	\$ 4,171
300A	Wrinkle	466.8	467.3	34	90.9	Post Rate Case	94.6%	>24	0.45	13.2	PG&E	1	\$ 5,925
118A	Field Miter	61.0	62.6	8.625	92.5	Post Rate Case	94.7%	<12	1.62	5.28	PG&E	1	\$ 8,563
300B	Wrinkle	284.6	286.1	34	94.0	Post Rate Case	94.8%	>24	1.47	13.2	PG&E	1	\$ 19,403
300A	Wrinkle	478.1	479.2	34	95.0	Post Rate Case	94.9%	>24	1.06	13.2	PG&E	1	\$ 14,000
126A	Field Miter	5.0	5.4	6.625	95.4	Post Rate Case	95.0%	<12	0.33	5.28	PG&E	1	\$ 1,761
300B	Wrinkle	413.2	414.8	34	96.7	Post Rate Case	95.1%	>24	1.32	13.2	PG&E	1	\$ 17,433
300A	Wrinkle	475.6	475.8	34	96.8	Post Rate Case	95.2%	>24	0.16	13.2	PG&E	1	\$ 2,113
300A	Wrinkle	420.1	422.3	34	99.1	Post Rate Case	95.2%	>24	2.24	13.2	PG&E	1	\$ 29,623
132	BBCR	51.5	51.5	24	99.1	Post Rate Case	95.3%	12-24	0.03	5.8	PG&E	1	\$ 157
300B	Wrinkle	408.3	409.5	34	100.4	Post Rate Case	95.4%	>24	1.24	13.2	PG&E	1	\$ 16,385
300A	Wrinkle	466.1	466.5	34	100.7	Post Rate Case	95.5%	>24	0.34	13.2	PG&E	1	\$ 4,545
300A	Wrinkle	479.9	480.5	34	101.5	Post Rate Case	95.6%	>24	0.83	13.2	PG&E	1	\$ 10,958
100	Field Miter	138.4	138.5	20	101.5	Post Rate Case	95.6%	12-24	0.02	5.8	PG&E	1	\$ 132
300B	Wrinkle	400.4	401.5	34	102.6	Post Rate Case	95.7%	>24	1.07	13.2	PG&E	1	\$ 14,080
300B	Wrinkle	238.0	238.8	34	103.4	Post Rate Case	95.8%	>24	0.81	13.2	PG&E	1	\$ 10,638
300A	Wrinkle	417.1	418.9	34	105.2	Post Rate Case	95.8%	>24	1.76	13.2	PG&E	1	\$ 23,188
300A	Wrinkle	466.5	466.8	34	105.5	Post Rate Case	95.9%	>24	0.28	13.2	PG&E	1	\$ 3,665
300B	Wrinkle	396.7	397.7	34	106.4	Post Rate Case	96.0%	>24	0.97	13.2	PG&E	1	\$ 12,803
210B	Field Miter	25.8	25.9	16	106.5	Post Rate Case	96.0%	12-24	0.10	5.8	PG&E	1	\$ 585
300B	Wrinkle	240.6	241.3	34	107.2	Post Rate Case	96.1%	>24	0.72	13.2	PG&E	1	\$ 9,448
132	BBCR	26.1	26.1	24	107.3	Post Rate Case	96.2%	12-24	0.02	5.8	PG&E	1	\$ 92
300B	Wrinkle	415.4	416.3	34	108.2	Post Rate Case	96.2%	>24	0.90	13.2	PG&E	1	\$ 11,825
300A	Wrinkle	475.5	475.6	34	108.3	Post Rate Case	96.3%	>24	0.10	13.2	PG&E	1	\$ 1,375
021B	Field Miter	13.6	14.3	16	109.0	Post Rate Case	96.3%	12-24	0.73	5.8	PG&E	1	\$ 4,213
300A	Wrinkle	463.9	464.1	34	109.2	Post Rate Case	96.4%	>24	0.24	13.2	PG&E	1	\$ 3,115
021B	Field Miter	14.3	15.0	16	109.9	Post Rate Case	96.4%	12-24	0.71	5.8	PG&E	1	\$ 4,131
132	BBCR	26.6	26.7	24	109.9	Post Rate Case	96.5%	12-24	0.01	5.8	PG&E	1	\$ 80
300B	Wrinkle	406.7	407.5	34	110.7	Post Rate Case	96.5%	>24	0.79	13.2	PG&E	1	\$ 10,445
114	Mfg Miter>=20	8.2	8.3	16	110.9	Post Rate Case	96.6%	12-24	0.14	5.8	PG&E	1	\$ 822
300A	Wrinkle	481.0	481.5	34	111.4	Post Rate Case	96.6%	>24	0.56	13.2	PG&E	1	\$ 7,378
1813-02	Wrinkle	1.1	1.5	10.75	111.8	Post Rate Case	96.7%	<12	0.38	5.28	PG&E	1	\$ 1,982
300B	Wrinkle	405.5	406.2	34	112.5	Post Rate Case	96.7%	>24	0.74	13.2	PG&E	1	\$ 9,708
210A	BBCR	23.2	24.1	10.75	113.5	Post Rate Case	96.8%	<12	0.94	5.28	PG&E	1	\$ 4,983
132	BBCR	26.6	26.6	24	113.5	Post Rate Case	96.8%	12-24	0.01	5.8	PG&E	1	\$ 74
300B	Wrinkle	287.0	287.7	34	114.2	Post Rate Case	96.9%	>24	0.72	13.2	PG&E	1	\$ 9,503
300B	Wrinkle	409.7	410.4	34	114.9	Post Rate Case	96.9%	>24	0.71	13.2	PG&E	1	\$ 9,435
300B	Wrinkle	428.7	429.5	34	115.6	Post Rate Case	97.0%	>24	0.71	13.2	PG&E	1	\$ 9,340
147	BBCR	0.6	0.6	24	115.7	Post Rate Case	97.0%	12-24	0.02	5.8	PG&E	1	\$ 99
300B	Wrinkle	287.7	288.4	34	116.3	Post Rate Case	97.1%	>24	0.68	13.2	PG&E	1	\$ 8,983
300A	Wrinkle	418.9	420.1	34	117.5	Post Rate Case	97.1%	>24	1.20	13.2	PG&E	1	\$ 15,788
300A	Field Miter	281.1	282.0	34	118.5	Post Rate Case	97.2%	>24	0.92	13.2	PG&E	1	\$ 12,145
300B	Wrinkle	251.7	253.1	34	119.8	Post Rate Case	97.2%	>24	1.34	13.2	PG&E	1	\$ 17,720
300A	Wrinkle	348.0	349.0	34	123.1	Post Rate Case	97.2%	>24	3.27	13.2	PG&E	1	\$ 43,153
300A	Wrinkle	430.6	431.8	34	124.2	Post Rate Case	97.3%	>24	1.14	13.2	PG&E	1	\$ 15,050
300B	Wrinkle	250.5	251.7	34	125.5	Post Rate Case	97.3%	>24	1.27	13.2	PG&E	1	\$ 16,788
300B	Wrinkle	395.8	396.5	34	126.1	Post Rate Case	97.4%	>24	0.63	13.2	PG&E	1	\$ 8,368
300B	Wrinkle	237.5	238.0	34	126.6	Post Rate Case	97.4%	>24	0.49	13.2	PG&E	1	\$ 6,503
300B	Wrinkle	404.6	405.2	34	127.2	Post Rate Case	97.5%	>24	0.63	13.2	PG&E	1	\$ 8,300
300A	Wrinkle	432.2	433.2	34	128.3	Post Rate Case	97.5%	>24	1.06	13.2	PG&E	1	\$ 13,940

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Unit Cost Analysis

Years	Units	\$/foot based on PSEP actuals & forecast 2012 & 2013 (x \$1,000)
24'-30" Highly congested SF Peninsula/San Jose		
	\$ per foot	\$2,500
	\$/mile	\$13,200
16-12" Congested Sacramento		
	\$ per foot	\$1,100
	\$/mile	\$5,808
< 12" Congested		
	\$ per foot	\$1,000
	\$/mile	\$5,280

1) Phase 1 costs were validated by comparing to 2011 and 2012 actuals for completed projects